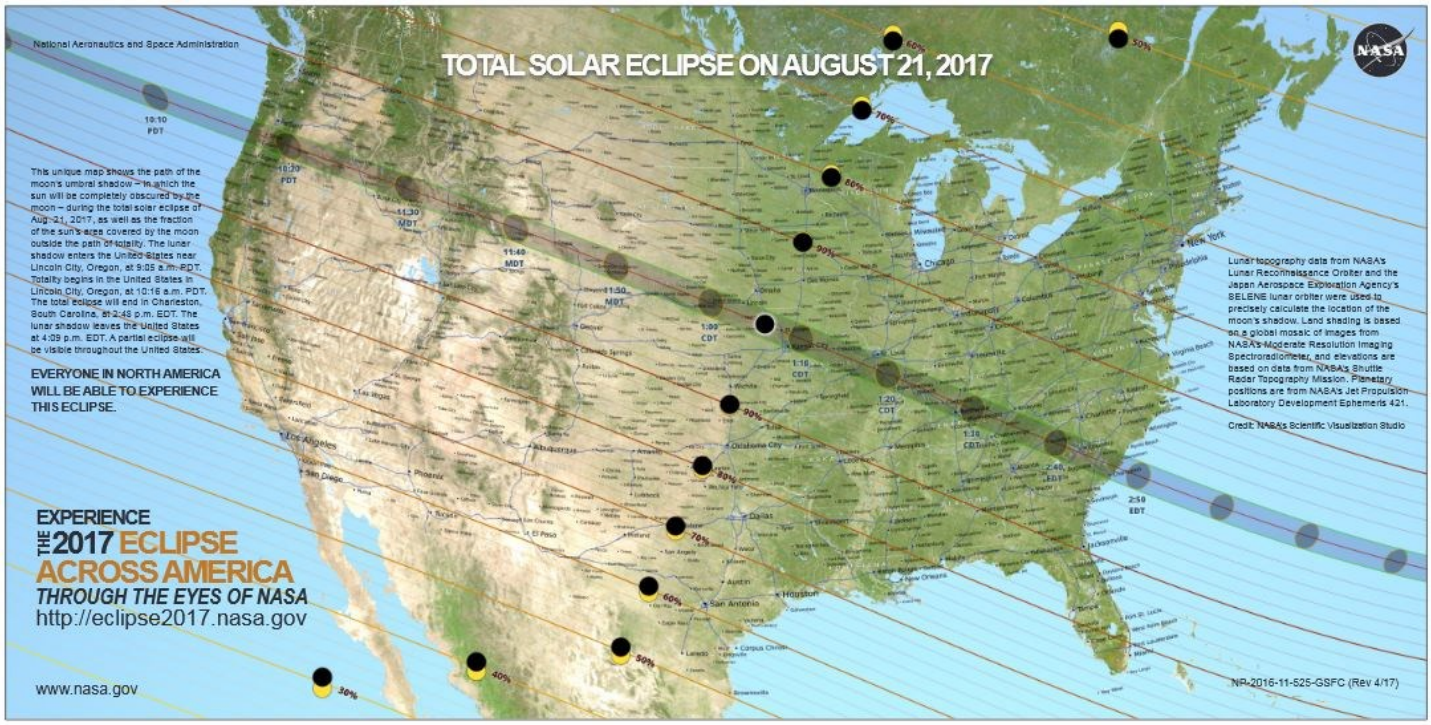
Eclipse 2017

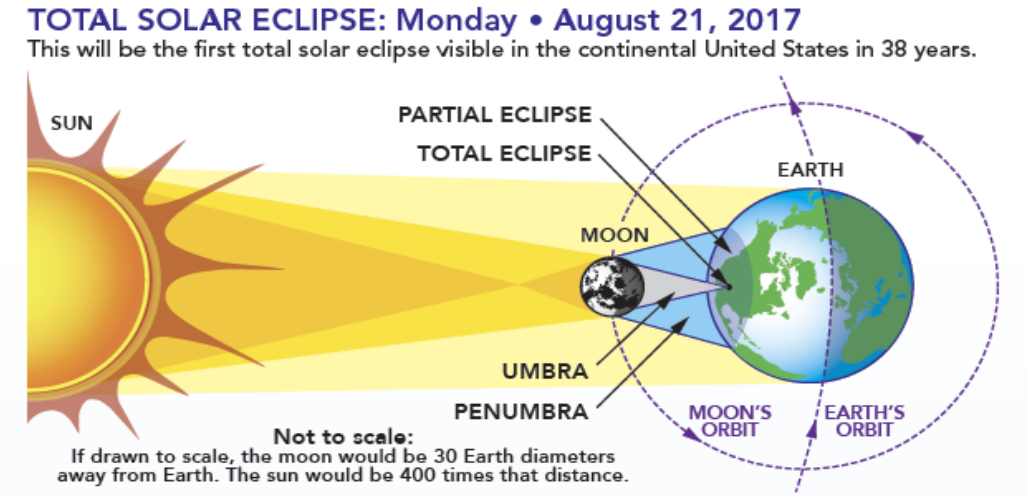


On August 21st, a total solar eclipse will move across the United States starting at the coast of Oregon and exiting off the coast of South Carolina. All of those in North America will be lucky enough to see at least a partial eclipse, weather depending of course. However, those lucky enough to be in the path of totality will get the rare treat of seeing the sun's corona once the sun is fully eclipsed. Only in the path of totality will the moon completely cover the sun, making the brighter stars and planets visible during the day. How does an eclipse work? What's the best way to view the solar eclipse without damaging your eyes? Where can you go to find out the weather for the eclipse? Read on for these answers…

What is an eclipse?

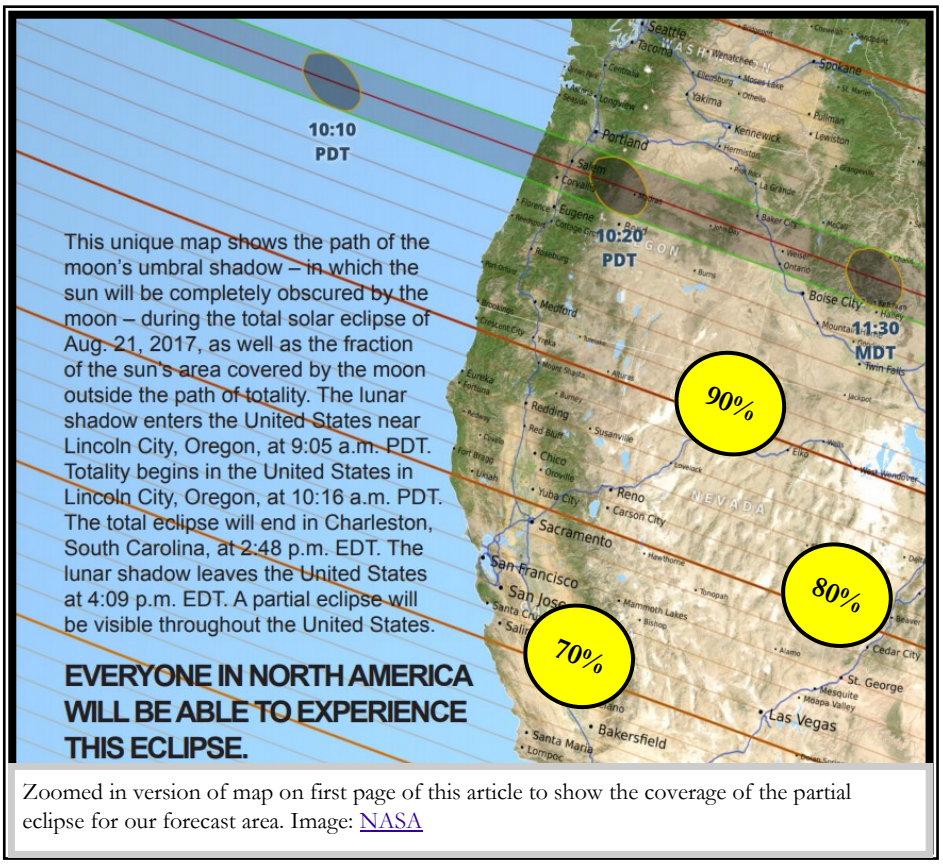
Whenever the sun, moon, and Earth align just right, an eclipse occurs. This can either be a solar or lunar eclipse, depending on the order of these celestial bodies. If the Earth moves between the sun and the moon, the Earth casts a shadow on the moon resulting in a lunar eclipse. On the other hand, when the moon moves between the Earth and sun at the correct angle, like what will happen on August 21st, the moon casts a shadow on the Earth, causing a solar eclipse.

When a solar eclipse occurs, there can be three different types of eclipses depending on either the alignment of these celestial bodies or the position of the moon on its elliptical path. The alignment of the Earth, sun and moon will determine if there is a partial or a total eclipse. A partial eclipse occurs either when the celestial bodies do not align correctly or if you are outside the narrow path of a total eclipse. If they



Depiction of alignment of the sun, earth, and moon that leads to a solar eclipse. Image: https://eclipse2017.nasa.gov/how-eclipses-work

are perfectly aligned, a total eclipse is possible, dependent on the moon's position on its elliptical path. At different times during its orbit, the moon is closer or further away from the Earth because the orbital path is not a perfect circle. When the moon is farther away from the Earth it will appear smaller and the relative size will not cover the sun completely, creating an annular eclipse. It's named annular for the ring of the sun that is still visible during this type of eclipse. On the other hand, when the moon is close enough to the earth, it will appear to completely cover the sun, resulting in a total eclipse. This is the kind of eclipse that will occur on August 21st. The downside is that the path of totality is a (relatively) narrow path of about 70 miles. Those outside this path will only get to view a partial eclipse. Although our forecast area is outside the total eclipse path, the partial eclipse will still be around 88-98% complete, with the percentage decreasing as you head further south.



Zoomed in version of map on first page of this article to show the coverage of the partial eclipse for our forecast area. Image: NASA

Safety & Viewing tips:

NEVER LOOK DIRECTLY AT THE SUN!! – The only time it is safe to look at the sun with the naked eye is during the brief time of totality (about 2 minutes), when the moon is completely blocking the sun, which only happens in the path of totality. If you are outside the path of totality, or trying to see the sun before it is completely eclipsed, you NEED a safe way to do so. Fortunately, there are a few different, inexpensive ways to make this happen. You can search the web for some simple home made ways to see the solar eclipse. NASA provides an in depth look at safety precautions during the eclipse as well as some DIY eclipse viewing projects. Please remember that polarized sunglasses are NOT safe to view the eclipse. Also, do NOT use unfiltered camera, binoculars, or telescopes to view the eclipse. These devices concentrate the sunlight, causing extreme damage to your eyes. You're essentially holding a magnifying glass to your eye, creating the same effect as burning grass using a magnifying glass.

What will the weather be like for the day:

Of course the awe of this event will be highly dependent on the weather. If there are clouds covering the sky, how will you see the eclipse?! It will still get noticeably darker during the eclipse, even with cloud cover, but you won't get to see the details if those pesky

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clouds are hanging around. While it's difficult to pinpoint the exact weather months in advance, we can look at climatology to tell us where you'd have a better chance of clear skies and unobstructed eclipse views. So if you're wondering what the skies *typically* entail on August 21st, check out the National Centers for Environmental Information website. They provide cloud cover climatology for select locations across the US and while this shouldn't be considered a forecast per say, it does provide you with the average conditions for that date. Based on these averages, they give a probability of clear sky conditions based on historical data. One thing to note is that just because there is a high probability of clear skies based on climatology, that doesn't mean that it will be clear on that date for this year. Climate is the personality, weather is the daily mood and some days are just better than others. Another thing to take into account is that August 21st is in the heart of fire season and it's not out of the possibility for thick smoke to obscure the sky that day.

Medford Weather Forecast Office: As we get closer to the event, weather offices will be able to provide a more detailed forecast within 7 days of the event. If you're venturing north or northeast to be in the path of totality, you can check with either the Portland or Pendleton forecast offices for details in their areas.

Resources:

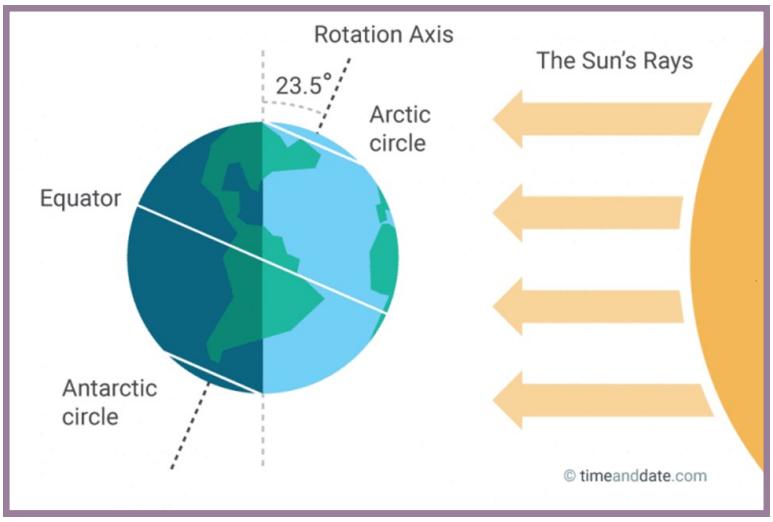
NASA: https://eclipse2017.nasa.gov/. This site has a plethora of information, and is the main source of information and graphics provided in this article. For more on safety tips, projects, events, or the science behind this astronomical event, check out NASA's page!

Eclipse Megamovie 2017: Google and Berkley teamed up to make this really neat site that will allow you to see a simulated version of what the eclipse should look like based on location. Simply type your town of interest in the box and hit play!

Summer Meteor Showers

Delta Aquarids—This meteor shower typically runs from mid July through mid August and is caused by debris from the comets Marsden and Kracht. This year, the show will peak somewhere between July 27th through 30th and the waxing crescent moon shouldn't interfere since it'll set before the midnight hour. The meteors will radiate from the constellation Aquarius and you should expect an average of 20 meteors during the peak of this shower. If weather allows, look to the southeast after midnight and enjoy the show!

Perseids—Debris from this shower is produced by the comet Swift-Tuttle and is probably the better meteor shower of the summer. During the peak of this shower, you could see up to 60 meteors per hour! The Perseids also run from mid July to mid-late August, but peaks on the nights of August 11th-12th and 12th-13th. The radiant point for the Perseids is the constellation Perseus. Unfortunately, this year a waning gibbous moon will hinder the ability to see all but the brightest of meteors. If you still want to give it a shot, get away from those city lights, grab a friend and look to the north and northeast for Perseus to deliver some shooting stars!



Summer Solstice

The summer solstice, the astronomical start of summer, fell on June 20th this year at 9:24 p.m. PDT. The word solstice comes from the Latin word "solstitium" which means sun-stopping. The summer solstice marks the time when the Northern Hemisphere has completely tilted toward the sun. The sun's rays are most intense on the northern Hemisphere and the position of the sun in the sky is at its farthest point north of the equator. After the summer solstice, the earth begins to tilt away from the sun until we reach the fall equinox and the beginning of fall. The summer solstice also marks the longest day of the year. On this day, there will be over 15 hours of daylight in southwest Oregon and northern California! Compare this to the winter solstice on December 21st when there are only 9 hours of daylight.